Electronic Version
Stylesheet Version v1.1.1

# Claims

[c1] What is claimed is:

1.A method of determining color composition of an image, the method comprising:

calculating an intensity value and a saturation value for each pixel of the image;

comparing the calculated intensity and saturation values for each pixel with first and second predetermined threshold values, respectively;

labeling pixels with calculated intensity values above the first predetermined threshold value and calculated saturation values above the second predetermined threshold value as color pixels;

applying a mask to the image and counting the number of color pixels out of the pixels selected by the mask; and

determining that the image is a color image if the number of color pixels selected by the mask is greater than or equal to a predetermined density value.

[c2] 2.The method of claim 1 wherein the intensity value of each pixel is calculated by the formula I=(R+G+B)/3, where I represents intensity value, R, G, and B respec-

tively represent red, green, and blue color levels.

[c3] 3.The method of claim 2 wherein the saturation value of each pixel is calculated by the formula S=1-Min(R, G, B)/I, where S represents the saturation value and Min(R, G, B) selects the minimum color level among the R, G, and B color levels.

[c4] 4.The method of claim 1 wherein after determining that the image is not a color image, the method further comprises:

calculating a first histogram of the intensity values of all of the pixels in the image, the first histogram being divided into a first predetermined number of intensity ranges;

choosing an intensity range in the first histogram containing the greatest number of pixels;

setting a median value of the chosen intensity range as a background value for the image;

updating the intensity values of the pixels in the image by performing a dilation function if the background value is greater than a third predetermined threshold value or performing an erosion function if the background value is less than or equal to the third predetermined threshold value;

calculating a second histogram of the updated intensity values of all of the pixels in the image, the second his-

togram being divided into a second predetermined number of intensity ranges; and
determining that the image is a black and white image if any one of the intensity ranges in the second histogram contains a number of pixels equal to or greater than a fourth predetermined threshold value, or determining that the image is a gray image otherwise.

[c5] 5.The method of claim 4 wherein when performing the dilation function, a window is applied to each pixel in the image and the intensity value of a center pixel of the window is replaced according to the equation I"=Max(W(p)), where I" represents the updated intensity of the center pixel, W(p) represents pixels included in the window around the center pixel, and Max(W(p)) represents the maximum intensity value of the pixels included in the window.

[c6] 6.The method of claim 5 wherein the window has dimensions of three pixels by three pixels.

[c7] 7.The method of claim 4 wherein when performing the erosion function, a window is applied to each pixel in the image and the intensity value of a center pixel of the window is replaced according to the equation I"=Min(W(p)), where I" represents the updated intensity of the center pixel, W(p) represents pixels included in the

window around the center pixel, and Min(W(p)) represents the minimum intensity value of the pixels included in the window.

[c8] 8.The method of claim 7 wherein the window has dimensions of three pixels by three pixels.

[c9] 9.The method of claim 1 wherein the mask has dimensions of three pixels by three pixels.

[c10] 10.The method of claim 1 wherein the predetermined density value is equal to seven pixels.